

### **AMENDMENTS TO THE CLAIMS**

*The listing of claims will replace all prior versions and listings of claims in the application:*

#### **Listing of Claims:**

1.     **(Currently Amended)**     A vertical cavity surface emitting laser (VCSEL), comprising:

at least one quantum well having a depth of at least 40 meV, wherein said depth is defined using the difference between a valence band offset and a conduction band offset and wherein said at least one quantum well comprises of material that is free of indium and is comprised of GaAsSb;

barrier layers sandwiching said at least one quantum well; and

confinement layers comprising GaAsP sandwiching said barrier layers.

2.     **(Previously Presented)**     The VCSEL of claim 1 wherein said barrier layers are comprised of GaAs and at least one of Al, N and P.

3.     **(Previously Presented)**     The VCSEL of claim 1 wherein said confinement layers are comprised of GaAs and at least one of Al, N and P.

4.     **(Original)**     The VCSEL of claim 1 wherein said confinement layers are comprised of AlGaAs.

5.     **(Original)**     The VCSEL of claim 1 wherein said barrier layers are comprised of AlGaAs.

6. **(Previously Presented)** The VCSEL of claim 1 wherein said barrier layers are comprised of GaAsP.

7. **(Previously Presented)** The VCSEL of claim 1 wherein said at least one quantum well further comprises greater than 1% N.

8. **(Cancelled)**

9. **(Previously Presented)** The VCSEL of claim 1 wherein said confinement layers are comprised of AlGaAs and said barrier layers are comprised of GaAsN.

10. **(Cancelled)**

11. **(Previously Presented)** The VCSEL of claim 6 wherein said confinement layers are comprised of GaAsN.

12. **(Currently Amended)** The VCSEL of claim 6 wherein said barrier layers are comprised of GaAsN and ~~said confinement layers are GaAsP.~~

13. **(Previously Presented)** The VCSEL of claim 4 wherein said at least one quantum well comprises >1% N.

14-18. **(Cancelled)**

19. **(Original)** The VCSEL of claim 1 wherein said quantum well is up to and including 50Å in thickness.

20. **(Previously Presented)** The VCSEL of claim 19 wherein said barrier layers are comprised of GaAs and at least one of Al, N and P.

21. **(Previously Presented)** The VCSEL of claim 19 wherein said confinement layers are comprised of GaAs and at least one of Al, N and P.

22. **(Previously Presented)** The VCSEL of claim 19 wherein said confinement layers are comprised of AlGaAs and said barrier layers are comprised of GaAsP.

23. **(Currently Amended)** The VCSEL of claim 19 wherein said barrier layers are comprised of AlGaAs and ~~said confinement layers are comprised of GaAsP.~~

24. **(Original)** The VCSEL of claim 19 wherein said barrier layers are comprised of AlGaAs.

25. **(Original)** The VCSEL of claim 19 wherein said at least one quantum well comprises N.

26. **(Original)** The VCSEL of claim 25 wherein said barrier layers are comprised of GaAsP.

27. **(Original)** The VCSEL of claim 25 wherein said confinement layers are comprised of AlGaAs.

28. **(Previously Presented)** The VCSEL of claim 26 wherein said confinement layers are comprised of AlGaAs.

29. **(Original)** The VCSEL of claim 27 wherein said barrier layers are comprised of AlGaAs.

30. **(Original)** The VCSEL of claim 25 wherein said barrier layers are comprised of AlGaAs.

31. **(Previously Presented)** The VCSEL of claim 19 wherein said at least one quantum well comprises  $>1\%$  N.

32. **(Original)** The VCSEL of claim 31 wherein said barrier layers are comprised of GaAsP.

33. **(Original)** The VCSEL of claim 31 wherein said confinement layers are comprised of AlGaAs.

34. **(Original)** The VCSEL of claim 32 wherein said confinement layers are comprised of AlGaAs.

35. **(Original)** The VCSEL of claim 33 wherein said barrier layers are comprised of AlGaAs.

36. **(Original)** The VCSEL of claim 31 wherein said barrier layers are comprised of AlGaAs.

37. **(Currently Amended)** A vertical cavity surface emitting laser (VCSEL), comprising:

at least one indium free quantum well comprised of GaAsSb, wherein the depth of said quantum well is defined using the difference between a valence band offset and a conduction band offset;

GaAs barrier layers sandwiching said at least one quantum well; and

GaAs confinement layers comprising GaAsP sandwiching said barrier layers.

38. **(Previously Presented)** The VCSEL of claim 37 wherein said barrier layers are comprised of GaAs and at least one of Sb, N, Al, P.

39. **(Previously Presented)** The VCSEL of claim 37 wherein said confinement layers are comprised of GaAs and at least one of Sb, N, Al, P.

40. **(Previously Presented)** The VCSEL of claim 37 wherein said confinement layers are comprised of AlGaAs and said barrier layers are comprised of GaAsN.

41. **(Currently Amended)** The VCSEL of claim 37 wherein said barrier layers are comprised of AlGaAs and ~~said confinement layers are comprised of GaAsP.~~

42. **(Previously Presented)** The VCSEL of claim 37 wherein said barrier layers are comprised of AlGaAs.

43. **(Previously Presented)** The VCSEL of claim 37 wherein said at least one quantum well further comprises  $>1\%$  N.

44. **(Previously Presented)** The VCSEL of claim 37 wherein said barrier layers are comprised of GaAsP.

45. **(Previously Presented)** The VCSEL of claim 37 wherein said confinement layers are comprised of AlGaAs.

46. **(Cancelled)**

47. **(Previously Presented)** The VCSEL of claim 37 wherein said quantum well is up to and including 50 Å in thickness.

48. **(Currently Amended)** A vertical cavity surface emitting laser (VCSEL), comprising:

at least one quantum well comprising ~~consisting essentially of GaAsSbN GaAsSb~~, wherein the depth of said quantum well is defined using the difference between a valence band offset and a conduction band offset;

GaAs barrier layers sandwiching said at least one quantum well; and

~~AlGaAs~~-confinement layers, comprising at least GaAsP, sandwiching said barrier layers.

49. **(Previously Presented)** The VCSEL of claim 48 wherein said barrier layers are further comprised of GaAsP.

50. **(Previously Presented)** The VCSEL of claim 48 wherein said barrier layers are further comprised of GaAsN.

51. **(Previously Presented)** The VCSEL of claim 48 wherein said at least one quantum well further comprises >1% N.

52. **(Original)** The VCSEL of claim 51 wherein said barrier layers are comprised of GaAsP.

53. **(Original)** The VCSEL of claim 51 wherein said barrier layers are comprised of AlGaAs.

54. **(Original)** The VCSEL of claim 48 wherein said quantum well is up to and including 50 Å in thickness.

55. **(Original)** The VCSEL of claim 54 wherein said barrier layers are comprised of GaAsP.

56. **(Original)** The VCSEL of claim 54 wherein said barrier layers are comprised of AlGaAs.

57. **(Previously Presented)** The VCSEL of claim 54 wherein said at least one quantum well further comprises >1% N.

58. – 59. **(Cancelled).**

60. **(New)** The VCSEL of claim 48, wherein said confinement layers comprise AlGaAs.